

Chapter 9

Options for Conserving Water

This chapter identifies options for conserving water in the future, the third of the specific tasks set out for the management plan in HB 397. This chapter begins with a definition of conservation, continues by describing existing activities in the basin that promote conservation, and then sets out additional options for conserving water in the future.

What Does Conservation of Water Mean?

To some, conservation has the connotation of saving rather than using. In this plan, conservation means the *long-term, sustainable use* of water resources. Water can be used beneficially through a diversion and instream. Water can be conserved by preserving the qualities that maintain instream uses as well as those that allow long-term sustained use for diversionary uses such as irrigation, stock watering, etc.

What is Presently Being Done to Promote Water Conservation in the Basin?

Current activities for water conservation in the basin may be identified in terms of one of three categories: administrative, management, or education and research.

Administrative

DNRC acts to promote long-term, sustainable water use by regulating water use through Montana's system of water rights. The rights, which can be bought and sold and leased, create the legal framework protecting individual water uses. Water rights also include use efficiency standards/guidelines designed to prevent waste, such as the one-inch-per-acre water duty (the minimum amount of water necessary to produce the desired benefit), which limits how much water can be used legally when irrigating, and the 10-year period after which a water right may be declared abandoned for non-use.

Management

Agencies, organizations, and individuals also conserve water through management activities. Individuals and water user organizations conserve water through experienced-based management activities such as timing irrigation, measuring water diversions, and maintaining headgates and irrigation ditches. Agencies and non-governmental organizations such as the Natural Resource Conservation Service (NRCS), Montana Rural Water Systems, Inc., DNRC, conservation districts, and water quality districts, provide funding and technical assistance to public and private water managers. Local governments are adopting requirements for onsite disposal of storm water rather than for collection and off-site disposal. Onsite disposal increases local aquifer recharge. Industries such as the Stone Container Mill and Plum Creek are also increasing renovation and reuse of water.

Some management activities designed to increase the "efficiency" of water use may, however, be counterproductive because they decrease water availability later in the year or for other water users or because they increase water consumption. Activities that may be counterproductive include converting flood irrigation to sprinkler, which can significantly reduce return flows to surface water, and using water salvage to increase crop production, thereby increasing water consumption through increased evapotranspiration and evaporation.

Particularly significant conservation management activities occur during periods of drought. In some areas, drought impacts are mitigated by managing water rights. In sub-basins with an

enforceable water rights decree, water rights holders can opt to petition district court for the appointment of a water commissioner who then allocates water pursuant to the decree (see Chapter 4). The Flint Creek Valley is an example of this approach. In other sub-basins, drought impacts are managed through development and implementation of voluntary drought plans. The Big Hole, Jefferson, and Blackfoot river basins use such plans. While each plan is unique, the three share several characteristics. The three plans:

- Were developed voluntarily, but were motivated by some combination of the following factors:
 - A perceived threat such as an Endangered Species Act listing (grayling in the Big Hole and bull trout in the Blackfoot), a requirement to measure all irrigation diversions, etc.;
 - Economics;
 - A sense of community, i.e., we are in this together;
 - The desire to preserve the quality of life; and
 - Individual personalities and social pressure;
- Were designed to meet fishery or instream flow objectives;
- Were based on trigger flows;
- Are locally implemented;
- Share shortages with sportsmen and sportswomen through fishing closures;
- Contain long-term water conservation measures such as ditch lining, wells for stock watering, and water trading; and
- Are funded through grants and donated services from agencies and individuals. (The Blackfoot plan annual costs are \$8-10,000).

Education and Research

Several entities now provide water conservation educational materials and activities: NRCS, DNRC, conservation districts, water quality districts, the county extension program, the Montana State University Research and Extension Service, Montana Rural Water Systems, Inc., and public and private water companies. The Montana Watercourse has available school curricula addressing water conservation. The Montana Bureau of Mines and Geology is conducting research to characterize the groundwater resource throughout the state, including the Clark Fork basin.

Future Options for Conservation of Water

Future options for conserving water (providing for long-term, sustainable water use), can also be categorized in terms of administration, management, and education and research.

Administration Options

Administrative actions that affect the long-term, sustainable use of water resources can be taken at the local, state, and federal government levels.

Local Government Actions - At the local level, city and county governments regulate land use through zoning and subdivision review. Cities and counties could use these powers to protect areas in which surface waters recharge groundwater and to require water meters in new subdivisions. According to personnel from the Montana Rural Water, Inc., a non-profit organization that provides technical assistance to rural municipalities, installing water meters is one of the largest incentives for water conservation and can reduce consumption by 50 to 60 percent. Cities and counties could require water meters in new subdivisions and government-owned water systems. Cities can also promote conservation through adoption of model conservation ordinances that regulate water use during periods of a water distribution shortfall. Model ordinances are available from Montana Rural Water Systems, Inc. Conservation districts have broad authority and can adopt ordinances.

Planning departments at the county level can adopt storm water ordinances.

State Government Actions - At the state level, DNRC can help to promote water conservation by improving its system for handling and managing water data to make the data more accessible to the public. DNRC could also require measurement of water use for new water permits and change authorizations. Finally, DNRC and DEQ could reach agreement about and coordinate information required from groundwater pump tests. DEQ now requires a pump test to result in 1.5 times the pump design flow rate, while DNRC requires the test to show the design flow rate. Requiring two different pump tests does not appear reasonable. DNRC and DEQ could work together to preserve information from the pump tests to increase our knowledge about the basin's groundwater supplies. DNRC could establish efficiency and net depletion guidelines for all water uses.

Federal Government Actions - The U.S. Forest Service manages about **XX%** of the land in the basin. The Organic Administrative Act of 1897 (Chapter 2, 30 Stat. 11, amended; 16 USC , 473-475, 477-478, 551), which originally authorized the administration of national forest lands, allowed the President to establish forest reserves (national forests) for three specific purposes:

- “To improve and protect the forest within their boundaries;”
- “*To secure favorable conditions of water flows*” (emphasis added), and
- “To furnish a continuous supply of timber.”

Subsequent acts regulating the USFS sustained these purposes. However, the USFS today does not appear to optimize favorable flow conditions in its management. It should do so.

Management Options

Individuals and water user organizations can take additional actions to provide for the long-term, sustainable use of water by measuring water uses and diversions; improving water conveyance efficiency; managing groundwater provided by irrigation; identifying, managing, and protecting areas in which surface waters recharge groundwater; and managing the supply side, e.g. using artificial recharge. Individuals, organizations, and, where appropriate, government agencies should work together to form sub-basin planning entities which in turn can and should develop and implement drought plans targeted at the objectives of local water users.

Education and Research

Education and research should also be used to increase the opportunities for conserving water. Government agencies and water user organizations should provide long-term, coordinated education for water users. This education should address activities that might affect groundwater recharge and quality and the connection between wasting water and wasting electricity. Specific research topics that should be pursued include:

- The connection between groundwater infiltration and base stream flow;
- The connection between the basin vegetation and base flow;
- Quantification of water conservation activities; and
- The 7-day average low flow in a 10-year period (sometimes known as 7Q10).